Calculus Warm Up #1- 4

Decide if the given sequence converges or diverges. Support your answer.

1) $a_n = \dfrac{n^2}{2^n - 1}$

2) $a_n = \dfrac{20e^n}{(n+3)!}$

Classwork:

Free Response Practice, # 1 - 3

With Graphing Calculator

1a) $\int_0^4 E(t)\,dt \approx 3{,}981$ gallons

b) possible extrema where $E(t) - 645 = 0$
or @ endpts where $t = 0 \;\&\; 4$

Max @ $t \approx 2.309$ hrs.
Max amount ≈ 1637 gallons.

c) $C(t) = 0.15 - 0.02t$ dollars/gal

Total cost $= \int_0^4 [C(t)][E(t)]\,dt$

$\approx \$474$

Week 1 Classwork: Turned in tomorrow

Warm Up on top

MC practice Part A, corrected with your chosen practice book problems attached.

FR practice #1 - 3

Week 1 HW Quiz: Tuesday, 4/3

p. 570, MC practice Part B, FR # 4 - 6

HW:

Finish up AP Practice tests

Check MC Part B answers.

(following this slide)

* Friday's HW: FR Practice # 4 - 6

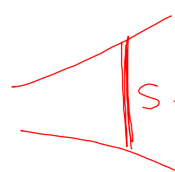
Check answers: MC part B, with calculator

76. C	83. D	90. E
77. D	84. E	91. D
78. E	85. D	92. C
79. A	86. B	
80. D	87. A	
81. B	88. C	
82. C	89. D	

Questions MC B:

77) $= \int_0^5 3\,dx + 2\left[\int_0^3 f(x)\,dx + \int_3^5 f(x)\,dx\right]$

85) Squares $A = s^2$



$s = \frac{x^2}{10} - \left(-\frac{x^2}{10}\right)$

$s = \frac{x^2}{5}$

$V = \int_1^4 A(x)\,dx$

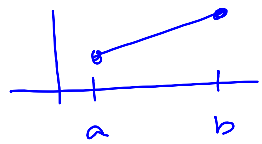
$= \int_1^4 \frac{x^4}{25}\,dx$

79) $W = 81.637$ gal. @ $t = 0$ $\frac{dW}{dt} = 9\sin\sqrt{t+1}$

$$W = 81.637 - \int_0^6 9\sin\sqrt{t+1}\,dt$$

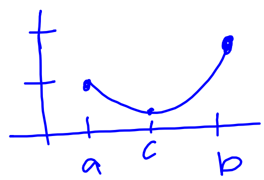
82) Counter example

~~A~~



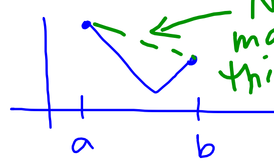
~~D~~ Same as

~~B~~



~~E~~ Missing the condition differ. on (a, b)

No c matches this slope



83)

$f'(2.8) < f'(3.0) < f'(3.1)$

29 30.5

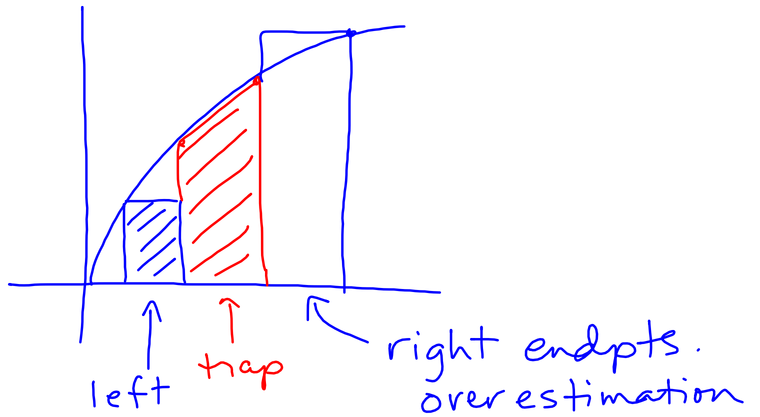
on $2.8 < x < 3.0$

$$f' \approx \frac{45 - 39.2}{3.0 - 2.8} \approx 29$$

on $3.0 < x < 3.1$

$$f' \approx \frac{48.05 - 45}{3.1 - 3.0} \approx 30.5$$

86)



88) $\text{Avg} = \frac{1}{b-a}\int_a^b f(x)\,dx$

90) $f(g(x)) = x$ $\rightarrow$ f + g are inverses

inverses have reciprocal slopes.

$f(3) = 8$ $\quad f'(3) = 9$

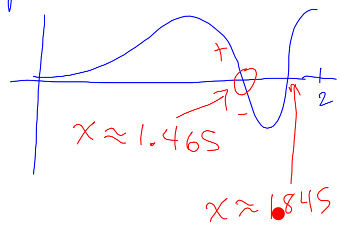
$\downarrow$

$g(8) = 3$ $\quad g'(8) = \frac{1}{9}$

91) Total distance $= \int_0^4 |v(t)|\,dt$

92) Max where f' goes from + to −

graph f'



Compare outcomes @ endpts & ≈ 1.465

$f(\approx 1.465) > f(0)$
because f increases on $(0, \approx 1.465)$

$$\int_{\approx 1.465}^{\approx 1.845} f'(x)\,dx \approx -0.240$$

$$\int_{\approx 1.845}^{2} f'(x)\,dx \approx 0.10$$